

# Richmond Refinery LPS Bulletin – Reliability

## HNC Compressor Seal Oil Trap K-1406B Level Failure



### IMPACT ERM:

Loss # 31986 LI # 16224

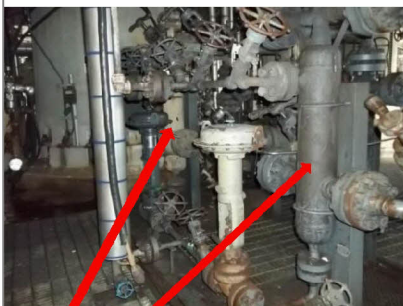
**Location:** Hydroprocessing Division, RLOP – Heavy Neutral Cracker (HNC)

### Contact Information:

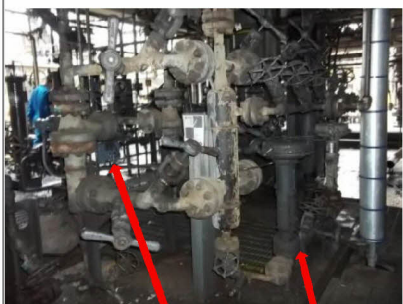
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K-1400 Seal Oil Traps K-1406A/B



Controller LC14668  
at K-1406B

Valve LV14668  
at K-1406B

***“Every Task.  
The Right Way.  
Every Time.”***

### Incident Description:

On Wednesday 2/22/2012 at 10:10 am, the K-1406B Seal Oil Trap at the RLOP HNC hydrogen compressor lost level. The pneumatic level controller LV14668 failed in the open position while the HNC compressor was running normally. RLOP's relief flow indicator 66FI099 surged upward for 2 seconds because the sour seal oil trap stuck open and gassed out to the flare header. Operators immediately responded and blocked in LC14668. Hydrogen from the K-1406B seal oil trap overwhelmed the common relief header to the Flare Gas Recovery system. The pneumatic transmitter and local level controller LC14668 malfunctioned rather than maintaining the seal oil trap liquid level. Similar malfunctions occurred on 2/18/2012 (NL # 31748) and on 11/27/2011 (LI # 16224) prior to this incident.

### Investigation Findings:

- 1) The compressor seal oil trap instruments were defined as non-critical in the Maximo database. However, gassing out seal oil traps to the plant flare header should be considered critical.
- 2) Field-controlled pneumatic instruments have a history of undetected malfunctions. None of the RLOP hydrogen compressor seal oil trap instruments have any PMs.
- 3) The pneumatic level controllers for the RLOP compressors are not readily available. There are no spare controllers on hand.
- 4) A post-mortem of LC14668 showed that the pneumatic transmitter and controller were significantly out of calibration, thereby preventing the valve from closing. The electronic displacer for remote level monitoring of each seal oil trap has no redundancy.

### Lessons Learned / Business Practices:

- 1) Accurate equipment criticality and appropriate PMs based on failure history are essential to detect equipment unreliability.

### Recommendations:

- 1) Update the Maximo criticality for compressor seal oil traps.
- 2) Perform routine PMs on pneumatic control loop and non-redundant electronic instruments.
- 3) Stock a common spare pneumatic controller.
- 4) Consider upgrading the pneumatic instruments to electronic equipment.

### Tenets of Operations Violated:

- #2. Always operate in a safe and controlled condition.
- #6. Always maintain integrity of dedicated systems.
- #10. Always involve the right people in decisions that affect procedures and equipment.

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